# Listing of Claims

**IN THE CLAIMS:**

The following listing of claims is intended to supercede all previously filed listings of claims. Changes are shown with deletions in ~~strikethrough~~ and additions underlined.

**Claim 1 (Currently Amended).** An object detection system for detecting and identifying targets, including:

a first module having a plurality of acoustic transmitters configured to generate a concatenated ultrasonic ~~waves~~ wavetrain including a first waveform configured to illuminate a target moving at a first speed and a second waveform configured to illuminate a target either moving at a second speed substantially slower than the first speed or being stationary, the wavetrain being transmitted in air and in a predetermined direction;

a second module having at least one acoustic receiver configured to receive reflected ultrasonic waves originating from the first module after reflection from a target; and

target identification logic coupled to the second module and configured to generate an output representative of the target.

**Claim 2 (Original).** The detection system of claim 1, wherein the first module includes a plurality of acoustic transmitters and the second module includes a plurality of acoustic receivers.

**Claim 3 (Original).** The object detection system of claim 2, wherein:

the acoustic transmitters are positioned in a generally collinear configuration oriented in a first direction;

the acoustic receivers are positioned in a generally collinear configuration oriented in a second direction;

the first direction and the second direction are nonparallel to one another.

**Claim 4 (Original).** The object detection system of claim 3, wherein the first direction is

substantially perpendicular to the second direction.

**Claim 5 (Original).** The object detection system of claim 1, wherein the target identification logic is configured to reduce background noise in the generated output.

**Claim 6 (Original).** The object detection system of claim 1, wherein the target identification logic is configured to reduce reverberation in the generated output.

**Claim 7 (Original).** The object detection system of claim 1, wherein the first and second modules are configured to minimize energy received at the second module from directions other than a predetermined direction targeted by the transmitter.

**Claim 8 (Original).** The object detection system of claim 1, wherein the second module includes at least a first said acoustic receiver and a second said acoustic receiver wherein the first said acoustic receiver is positioned above the second said acoustic receiver.

**Claim 9 (Original).** The object detection system of claim 1, further including feature extract logic configured to generate signals representative of at least one physical characteristic of the target.

**Claim 10 (Original).** The object detection system of claim 1, wherein the first and second modules are configured to reduce energy from directions other than a predetermined direction targeted by the transmitter.

**Claim 11 (Original).** The object detection system of claim 1, further including logic configured to identify targets based upon clusters derived from the reflected acoustic waves.

**Claim 12 (Original).** The object detection system of claim 1, wherein the produced ultrasonic waves include concatenated waves of different types.

**Claim 13 (Currently Amended).** The object detection system of claim 12, wherein the ~~interpretation~~ identification logic is configured to reduce reverberation in the generated output.

**Claim 14 (Original).** The object detection system of claim 12, wherein the first and second modules are configured to minimize energy received at the second module from directions other than a predetermined direction targeted by the transmitter.

**Claim 15 (Original).** The object detection system of claim 12, further including logic configured to correlate data of multiple pings to improve the received data.

**Claim 16 (Currently Amended).** The object detection system of claim 12, wherein the ~~interpretation~~ identification logic is configured to provide cluster analysis of over-resolved echo return from a single object.

**Claim 17 (Currently Amended).** An area detection system including a plurality of object detection systems for detecting an identifying targets, each object detection system including:

a first module having a plurality of acoustic transmitters configured to generate a concatenated ultrasonic ~~waves~~ wavetrain including a first waveform configured to illuminate a target moving at a first speed and a second waveform configured to illuminate a target either moving at a second speed that is substantially slower than the first speed or being stationary, the wavetrain being transmitted in air and in a predetermined direction;

a second module having at least one acoustic receiver configured to receive reflected ultrasonic waves originating from the first module after reflection from a target; and

target identification logic coupled to the second module and configured to generate an output representative of the target.

**Claim 18 (Currently Amended).** The area detection system of claim ~~20~~17, wherein the

generated ultrasonic waves from the respective object detection systems are configured to substantially overlay at a predetermined stand-off range.

**Claim 19 (Currently Amended).** The area detection system of claim ~~20~~ 17, further including integration logic configured to receive the generated outputs from each of the object detection systems and to generate an integrated output representing targets in a predetermined area.

**Claim 20 (Currently Amended).** The area detection system of claim ~~22~~19, wherein the integrated logic is configured to eliminate multiple representations of generated ultrasonic waves reflected from a single target.

**Claim 21 (Currently Amended).** An object detection system including:

(a) a first module having a plurality of acoustic transmitters configured to generate a concatenated ultrasonic ~~waves~~ wavetrain including a first waveform configured to illuminate a target moving at a first speed and a second waveform configured to illuminate a target either moving at a second speed substantially slower than the first speed or being stationary, the wavetrain being transmitted in air and in a predetermined direction;

(b) a second module having a plurality of receivers configured to receive reflected ultrasonic waves originating from the first module after reflection from a target;

(c) first logic configured to identify targets based upon clusters derived from reflected acoustic waves;

(d) second logic configured to minimize energy received at the second module from directions other than a predetermined direction targeted by the transmitter; and

(e) third logic configured to generate signals representative of at least one physical characteristic of the target and

wherein the acoustic transmitters are positioned in a generally collinear configuration oriented in a first direction;

wherein the acoustic receivers are positioned in a generally collinear configuration oriented in a second direction which is substantially perpendicular to the first direction.

**Claim 22 (Currently Amended).** A method of acoustically detection objects, the steps including:

generating a concatenated ultrasonic ~~waves~~ wavetrain including a first waveform configured to illuminate a target moving at a first speed and a second waveform configured to illuminate target either moving at a second speed that is substantially slower than the first speed or being stationary, the wavetrain being transmitted in air and in a predetermined direction;

transmitting the generated ultrasonic waves through air towards a target;

receiving ultrasonic waveforms from a set of at least one acoustic receiver configured to receive reflected ultrasonic waves originating from the first module after reflection from the target; and

processing ultrasonic waveforms with target identification logic coupled to the at least one acoustic receiver and configured to generate an output representative of the target.

**Claim 23 (Original).** The method of claim 22, further comprising the steps of:

determining whether the received ultrasonic waves are false alarms.

**Claim 24 (Currently Amended).** The method of claim ~~21~~22, wherein the ultrasonic waves are received by an array of receivers.

**Claim 25 (Currently Amended).** The method of claim ~~21~~22, wherein the ultrasonic waves are generated by an array of transducers.

**Claim 26 (Currently Amended).** The method of claim ~~21~~22, wherein the ultrasonic waves are generated by a single transducer.

**Claim 27 (Original).** The method of claim 22, wherein the step of classifying the received ultrasonic waves includes identifying targets based upon clusters derived from reflected acoustic waves.